

**ULTRA-THIN Si MOSFET DEVICE STRUCTURE AND METHOD OF  
MANUFACTURE**

The present invention comprises a method for forming an ultra-thin channel MOSFET and the ultra-thin channel MOSFET produced therefrom. Specifically, the method comprises providing an SOI substrate having a buried insulating layer underlying an SOI layer; forming a pad stack atop the SOI layer; forming a block mask having a channel via atop the pad stack; providing a localized oxide region in the SOI layer on top of the buried insulating layer thereby thinning a portion of the SOI layer, the localized oxide region being self-aligned with the channel via; forming a gate in the channel via; removing at least the block mask; and forming source/drain extensions in the SOI layer abutting the thinned portion of the SOI layer. Providing the localized oxide region further comprises implanting oxygen dopant through the channel via into a portion of the SOI layer; and annealing the dopant to create the localized oxide region.